BIOTIC COMMUNITY

Fish Community Data

Aquatic sampling in the Elk River basin has been ongoing since before the initial elements occurrence record (EOR) was written in 1982. Table 13 lists fish that have been collected and identified by sub-basin within the Elk River basin in Missouri using records from the 1930's to present. Collections of fish were also made by the Missouri Department of Conservation's Southwest Regional Staff during 1997 and 1998 (Figure 19). The samples were collected to assess basin-wide fish communities. Thirty-five species of fish were identified from these samples. Appendix C has collections by site and date for the Elk River basin.

Seventy species of fish have been collected from the Elk River basin in Missouri. There are no sample records from the time period 1965-1982 for the Elk River basin. Fifty-nine species were collected prior to 1982 and eleven species have not been collected since 1965. The channel darter was last sampled prior to 1946 and never had a widespread occurrence in the watershed. According to Pflieger (1997) the channel darter probably no longer exists in the watershed. Table 14 lists the species and indicates the time periods in which they were collected. Fifteen species found between 1982 and 1991 were not sampled during 1997-98. These absences may have occurred for several reasons. Only specific sportfish populations were sampled during 1998 samples (N = 2) and non-game fish were not collected. For the majority of the fish missing from the 1997 samples (N = 17), inadequate sampling or sampling error could be factors in their absence. Twelve of the species missing from the 1997 samples, grass carp, common carp, quillback, bigmouth buffalo, river redhorse, black redhorse, golden redhorse, shorthead redhorse, white crappie, black crappie, warmouth, and freshwater drum are large species which readily avoid seine hauls and are commonly found in habitats too brushy or deep to seine. Seining was the only method used in these samples, and is probably the reason for their absence. Only one fathead minnow has been collected (in 1984), and Pflieger (1997) indicates that most records of fathead minnows from the Ozark faunal region, including the Elk River basin, are introductions from bait buckets, and few self-sustaining populations exist. Ozark cavefish usually are not captured unless sought in caves, or near spring openings flowing from a subterranean source during high flow or pollution related events. Logperch was the other species not captured during seining in 1997.

It is possible that some species are being lost from the watershed. Bluntface shiners are a state watch list species, and Pflieger (1997) lists them as more common and widespread prior to the 1950s. They were sampled at five locations prior to 1964. Bluntface shiners were last collected by MDC personnel in the watershed in 1991 in the lower Elk River. The USGS conducted a series of surveys on the lower Elk River as part of a water quality study (NAWQA) and captured low numbers of bluntface shiners in 1994 and 1995 (J. Petersen, USGS, pers. comm.). The same site was surveyed by MDC in 1997 with no bluntface shiners collected. Wedgespot shiners were last collected by MDC personnel in the watershed in 1991. The USGS conducted a series of surveys on the lower Elk River as part of a water quality study (NAWQA) and collected low numbers of wedgespot shiners in 1993, 1994, and 1995 (J. Petersen, USGS, pers. comm.). It appears that bluntface shiners and wedgespot shiners are still present in the lower

Table 13. Fish species list by stream for the Elk River basin.

Common Name	Species	Lost	Buffalo	Indian	Elk	Butler	B. Sugar	Mikes	L. Sugar
Rock bass	Ambloplites rupestris		X	X	X	X	X	X	X
Ozark cavefish	Amblyopsis rosae	X	X						
Black bullhead	Ameirus melas			X	X				
Yellow bullhead	Ameirus natalis			X	X				
Freshwater drum	Aplodinotus grunniens				X				
Central stoneroller	Campostoma pullum	X	X	X	X	X	X	X	X
River carpsucker	Carpiodes carpio				X				
Quillback	Carpiodes cyprinus				X				
White sucker	Catostomus commersoni		X	X					
Banded sculpin	Cottus carolinae	X	X	X	X	X	X	X	X
Grass carp	Ctenopharyngodon idella				X				
Blue sucker	Cycleptus elongatus				X				
Bluntface shiner	Cyprinella camura		X	X	X				
Red shiner	Cyprinella lutrensis		X		X				
Common carp	Cyprinus carpio				X				
Gizzard shad	Dorosoma cepedianum				X				
Gravel chub	Erimystax x-punctatus				X				
Greenside darter	Etheostoma blennioides			X	X	X	X		X
Fantail darter	Etheostoma flabellare	X	X	X	X	X	X	X	
Johnny darter	Etheostoma nigrum			X					
Stippled darter	Etheostoma punctulatum		X	X	X	X		X	X
Orangethroat darter	Etheostoma spectabile	X	X	X	X	X	X	X	X
Speckled darter	Etheostoma stigmaeum			X					X
Banded darter	Etheostoma zonale			X	X		X		X
Northern studfish	Fundulus catenatus		X	X	X	X	X	X	X
Blackstripe topminnow	Fundulus notatus		X	X	X		X		X
Plains topminnow	Fundulus sciadicus	X							
Western mosquitofish	Gambusia affinis	X	X	X	X		X		
Northern hog sucker	Hypentelium nigricans		X	X	X	X	X		X
Southern brook lamprey	Ichthyomyzon gagei				X				

Channel catfish	Ictalurus punctatus			X	X				X
Bigmouth buffalo	Ictiobus cyprinellus				X				
Black buffalo	Ictiobus niger		X		X				
Brook silverside	Labidesthes sicculus			X	X				X
Longnose gar	Lepisosteus osseus				X				
Green sunfish	Lepomis cyanellus	X		X	X		X		X
Warmouth	Lepomis gulosus				X				
Orangespotted sunfish	Lepomis humilis			X					
Bluegill	Lepomis macrochirus		X	X	X	X		X	X
Longear sunfish	Lepomis megalotis	X	X	X	X	X	X		X
Redear sunfish	Lepomis microlophus			X					
Cardinal shiner	Luxilus cardinalis	X	X	X	X	X	X	X	X
Redfin shiner	Lythrurus umbratilis			X					
Smallmouth bass	Micropterus dolomieu		X	X	X	X	X	X	X
Spotted bass	Micropterus punctulatus				X				
Largemouth bass	Micropterus salmoides		X	X	X	X			X
White bass	Morone chrysops				X				
Shorthead redhorse	Moxostoma macrolepidotum				X				
River redhorse	Moxostoma carinatum				X				
Black redhorse	Moxostoma duquesnei		X	X	X		X		X
Golden redhorse	Moxostoma erythrurum				X				
Redspot chub	Nocomis asper	X	X	X	X	X	X	X	X
Hornyhead chub	Nocomis biguttatus		X						
Golden shiner	Notemigonus crysoleucas			X					
Bigeye chub	Notropis amblops			X	X	X	X		X
Bigeye shiner	Notropis boops			X	X	X	X		X
Wedgespot shiner	Notropis greenei			X	X				
Ozark minnow	Notropis nubilus	X	X	X	X	X	X		X
Rosyface shiner	Notropis rubellus	X	X	X	X	X	X		X
Slender madtom	Noturus exilis	X	X	X	X	X	X	X	X
Rainbow trout	Oncorhynchus mykiss			X					
Logperch	Percina caprodes				X				
Channel darter	Percina copelandi				X				

Southern redbelly dace	Phoxinus erythrogaster	X	X	X			X		X
Bluntnose minnow	Pimephales notatus		X	X	X	X	X		
Fathead minnow	Pimephales promelas						X		
White crappie	Pomoxis annularis			X	X				
Black crappie	Pomoxis nigromaculatus				X				
Flathead catfish	Pylodictus olivaris				X				
Creek chub	Semotilus atromaculatus	X	X	X	X	X	X	X	

Table 14. Fish species list by stream for the Elk River basin.

Common Name	Scientific Name	Period ¹
Southern brook lamprey	Ichthyomyzon gagei	В
Longnose gar	Lepisosteus osseus	C, D
Gizzard shad	Dorosoma cepedianum	A, C, D
Rainbow trout	Oncorhynchus mykiss	A
Central stoneroller	Campostoma pullum	A, B, C, D, E
Grass carp	Ctenopharyngodon idella	С
Common carp	Cyprinus carpio	C, D
Bluntface shiner	Cyprinella camura	A, B, D
Red shiner	Cyprinella lutrensis	A, D
Gravel chub	Erimystax x-punctatus	A, B, D
Cardinal shiner ²	Luxilus cardinalis	A, B, C, D, E
Redfin shiner	Lythrurus umbratilis	A
Redspot chub ²	Nocomis asper	A, B, C, D, E
Hornyhead chub	Nocomis biguttatus	D
Golden shiner	Notemigonus crysoleucas	В
Bigeye chub	Notropis amblops	A, B, D, E
Bigeye shiner	Notropis boops	A, B, D, E
Wedgespot shiner	Notropis greenei	A, B, D
Ozark minnow	Notropis nubilus	A, B, C, D, E
Rosyface shiner	Notropis rubellus	A, B, C, D, E
Southern redbelly dace	Phoxinus erythrogaster	A, B, C, D, E
Bluntnose minnow	Pimephales notatus	A, B, C, D, E
Fathead minnow	Pimephales promelas	C
Creek chub	Semotilus atromaculatus	A, B, D, E

River carpsucker	Carpiodes carpio	В
Quillback	Carpiodes cyprinus	С
White sucker	Catostomus commersoni	A, B
Blue sucker	Cycleptus elongatus	A
Northern hog sucker	Hypentelium nigricans	A, B, C, D, E
Bigmouth buffalo	Ictiobus cyprinellus	С
Black buffalo	Ictiobus niger	A
River redhorse	Moxostoma carinatum	B, C
Black redhorse	Moxostoma duquesnei	A, B, C, D
Golden redhorse	Moxostoma erythrurum	A, B, C, D
Shorthead redhorse	Moxostoma macrolepidotum	A, C
Black bullhead	Ameiurus melas	B, D
Yellow bullhead	Ameiurus natalis	B, D
Channel catfish	Ictalurus punctatus	A, B, C, D, E
Flathead catfish	Pylodictis olivaris	C, D, E
Slender madtom	Noturus exilis	A, B, C, D, E
Ozark cavefish	Amblyopsis rosae	B, C
Northern studfish	Fundulus catenatus	A, B, C, D, E
Blackstripe topminnow	Fundulus notatus	A, B, D, E
Plains topminnow	Fundulus sciadicus	D
Western mosquitofish	Gambusia affinis	A, B, D, E
Brook silverside	Labidesthes sicculus	A, B, C, D, E
White bass	Morone chrysops	D, E
Rock bass	Ambloplites rupestris	A, B, C, D, E
Green sunfish	Lepomis cyanellus	A, B, C, D, E
Warmouth	Lepomis gulosus	B, C, D

Orangespotted sunfish	Lepomis humilis	A
Bluegill	Lepomis macrochirus	A, B, C, D, E
Longear sunfish	Lepomis megalotis	A, B, C, D, E
Redear sunfish	Lepomis microlophus	B, E
Smallmouth bass	Micropterus dolomieu	A, B, C, D, E
Spotted bass	Micropterus punctulatus	A, B, C, D, E
Largemouth bass	Micropterus salmoides	A, B, C, D, E
White crappie	Pomoxis annularis	A, B, C
Black crappie	Pomoxis nigromaculatus	С
Greenside darter	Etheostoma blennioides	A, B, D, E
Fantail darter	Etheostoma flabellare	A, B, C, D, E
Johnny darter	Etheostoma nigrum	В
Stippled darter	Etheostoma punctulatum	A, B, D, E
Orangethroat darter	Etheostoma spectabile	A, B, C, D, E
Speckled darter	Etheostoma stigmaeum	A, B, C, D, E
Banded darter	Etheostoma zonale	A, B, D, E
Logperch	Percina caprodes	A, C, D
Channel darter ²	Percina copelandi	A
Freshwater drum	Aplodinotus grunniens	C, D
Banded sculpin	Cottus carolinae	A, B, C, D, E

 $^{^1}$ - A = collected prior to 1946, B = collected between 1946 and 1982, C = collected between 1982 and 1990, D = collected between 1990 and 1996, E = collected in 1997 and 1998.

Source: Pflieger (1997), MDC Southwest Region Fisheries Files, J. Goddard and H. Kerns collection notes from 1982, W. Pflieger and P. Wohldman collection notes from 1991, J. Petersen, USGS, personal communication.

 $^{^{2}}$ - Indicates species restricted to the Neosho basin (Spring and Elk rivers) in Missouri.

Elk River but are not as abundant as they were historically. Fish surveys seem to indicate a healthy fish population. Declines in some species have occurred, but may not be unique to the Elk River system.

Aquatic Invertebrates

Table 15 lists crayfish with ranges including the Elk River basin. Only four of the six species have been documented by collection in the basin. Mussel surveys for basin streams are limited. A survey of mussels in the Elk River basin was conducted by Mark Gordon in the late 1970s (Gordon 1980). Thirty species were collected from the basin. Oesch (1984) indicates many mussels occurred in the basin historically. Table 16 lists mussel and snail species collected in the Elk River basin.

Amphibians and Reptiles

There is a diverse assemblage of amphibians and reptiles found in the Elk River basin. Table 17 lists the amphibians and Table 18 lists the reptiles. These tables also include the known range for each species in the basin.

Species of Conservation Concern

The Elk River Basin contains a unique and diverse flora and fauna that includes four federally endangered species. The endangered species are running buffalo clover (*Trifolium stoloniferum*), peregrine falcon (*Falco peregrinus*), Indiana bat (*Myotis sodalis*), and gray bat (*Myotis grisescens*). The two federally threatened species found in the Elk River basin are the Ozark cavefish (*Amblyopsis rosae*) and bald eagle (*Haliaeetus leucocephalus*).

Fish Stocking

Large numbers of fish have been stocked in private impoundments such as farm ponds throughout the Elk River basin. Stocking records for public waters are maintained by the state and federal agencies responsible for their management. Rainbow trout, brook trout, brown trout, lake trout, and grayling were historically stocked throughout the basin, but with the exception of small springfed stream reaches that support rainbow trout, they were unsuccessful. Excluding private impoundment stocking, the only documented warmwater fish stockings in the basin have been carried out by the Arkansas Game and Fish Commission and Bella Vista Property Owners Association in the lakes at Bella Vista, Arkansas. Largemouth bass, bluegill, redear sunfish, channel catfish, blue catfish, black crappie, white crappie, and fathead minnows have been stocked in various lakes in Bella Vista. These lakes empty into streams in the Little Sugar Creek sub-basin. Stocking records for the Elk River basin are found in Appendix D.

Angler Survey

The first fishing effort and harvest information available for the Elk River basin is the statewide general creel census compiled by Funk (1969) for the years 1946 through 1958. A wide variety of fish species were reportedly harvested during this time. The fish harvest by number indicated that channel catfish were the most commonly taken closely followed by suckers and green sunfish. Other fish, in order by number harvested, were smallmouth bass, rock bass, freshwater drum, largemouth bass, other sunfish, trout, common carp, crappie, white bass, bullheads, flathead catfish, and buffalo. The most recent survey found that catfish were the most sought-after species, followed by black bass. Using harvest to compare present information to historical information, catfish is still numerically the most commonly harvested fish species, followed by largemouth bass, white bass, smallmouth bass, rock bass, drum, suckers, gar,

Table 15. Crayfish with ranges including the Elk River basin in Missouri.

Common Name	Scientific Name	Collection
Bristly cave crayfish	Cambarus setosus	between 1971-1992
Neosho midget crayfish	Orconectes macrus	between 1971-1992
Ringed crayfish	Orconectes neglectus	between 1971-1992
Northern crayfish	Orconectes virilis	between 1971-1992
Grassland crayfish	Procambaris gracilis	No (range includes Elk River basin)
Cave crayfish	Cambarus aculabrum (found in cave in NW Arkansas)	No (origin of locality stream may be in McDonald County, MO)

Source: Pflieger (1996).

Table 16. Mussels and snails collected in the Elk River basin in Missouri.

Common Name	Scientific Name ¹	Collection ²
Midland siltsnail	Cincinnatia integra	1980
Chert pebblesnail	Somatogyrus rosewateri	1980
Slender walker	Pomatiopsis lapidaria	1980
Pyramid elimia	Elimia potosiensis	1980
Tadpole physa	Physella gyrina	1980
Bugle sprite	Menetus dilatatus	1980
Marsh rams-horn	Helisoma trivolvis	1980
Creeping ancylid	Ferrissia rivularis	1980
Striated fingernail clam	Sphaerium striatinum	1980
River peaclam	Pisidium fallax	1980
Ridged-beak peaclam	Pisidium compressum	1980
Paper pondshell	Utterbackia imbecillis	after 1965, 1980
Giant floater	Pyganodon grandis	after 1965, 1980
Creeper	Strophitus undulatus	after 1965, 1980
Elktoe	Alasmidonta marginata	after 1965, 1980
Slippershell	Alasmidonta viridis	after 1965, 1980
Flutedshell	Lasmigonia costata	after 1965
Pimpleback	Quadrula pustulosa pustulosa	after 1965
Wabash pigtoe	Fusconaia flava	after 1965
Ozark pigtoe	Fusconaia ozarkensis	after 1965
Purple wartyback	Cyclonaias tuberculata	after 1965
Ohio pigtoe	Pleurobema cordatum ³	1980
Round pigtoe	Pleurobema sintoxia	after 1965
Mucket	Actinonaias ligamentina	after 1965, 1980
Ellipse	Venustaconcha ellipsiformis4	1980

Fragile papershell	Leptodea fragilis	after 1965
Lilliput	Toxolasma parvus	after 1965
Purple Lilliput	Toxolasma lividus	after 1965, 1980
Pondmussel	Ligumia subrostrata	after 1965
Neosho mucket	Lampsilis rafinesqueana	after 1965
Pocketbook	Lampsilis cardium	after 1965
Ozark brokenray	Lampsilis reeviana brevicula	after 1965
Asian clam	Corbicula fluminea	1998

Sources: Oesch (1984), Cummings and Mayer (1992), and Gordon (1980).

- 1 Scientific names were updated through 1999 based on information provided by Sue Bruenderman, MDC research biologist/Malacologist.
- ² after 1965 based on information from Oesch 1984.
- 3 Sue Bruenderman believes this identification may be in error and probably should be Fusconaia flava.
- ⁴ Riusech (1999) through genetic analysis found the mussels in the Elk River basin to be ellipse (*Venustaconcha ellipsiformis*) rather than bleedingtooth mussels (*Venustaconcha pleasii*).

Table 17. Amphibians found in the Elk River basin.

Common Name	Scientific Name	Range
Ringed salamander	Ambystoma annulatum	Basinwide
Spotted salamander	Ambystoma maculatum	Basinwide
Marbled salamander	Ambystoma opacum	Eastern counties of the basin
Smallmouth salamander	Ambystoma texanum	Western counties of the basin
Eastern tiger salamander	Ambystoma tigrinum tigrinum	Basinwide
Central newt	Notophthalmus viridescens louisianensis	Basinwide
Longtail salamander	Eurycea longicauda	Basinwide
Cave salamander	Eurycea lucifuga	Basinwide
Graybelly salamander	Eurycea multiplicata griseogaster	Basinwide
Oklahoma salamander	Eurycea tynerensis	Basinwide
Ozark zigzag salamander	Plethodon dorsalis angusticlavius	Basinwide
Slimy salamander	Plethodon glutinosus glutinosus	Basinwide
Grotto salamander	Typhlotriton spelaeus	Basinwide
Red River mudpuppy	Necturus maculosis louisianensis	Basinwide
Dwarf American toad	Bufo americanus charlesmithi	Basinwide
Fowler's toad	Bufo woodhousei fowleri	Basinwide
Woodhouse's toad	Bufo woodhousei woodhousei	possibly in Newton County
Blanchard's cricket frog	Acris crepitans blanchardi	Basinwide
Northern spring peeper	Hyla crucifer crucifer	Basinwide
Cope's gray treefrog	Hyla chrysoscelis	Basinwide
Western chorus frog	Pseudacris triseriata	Basinwide
Eastern narrowmouth toad	Gastrophryne carolinensis	Basinwide
Great Plains narrowmouth toad	Gastrophryne olivacea	Western counties of the basin

Northern crawfish frog	Rana areolata circulosa	Western counties of the basin
Bullfrog	Rana catesbeiana	Basinwide
Green frog	Rana clamitans	Basinwide
Pickerel frog	Rana palustris	Basinwide
Southern leopard frog	Rana sphenocephala	Basinwide
Wood frog	Rana sylvatica	Eastern counties of the basin

Source: Johnson (1987).

Table 18. Reptiles found in the Elk River basin.

Common Name	Scientific Name	Range
Common snapping turtle	Chelydra serpentina serpentina	Basinwide
Alligator snapping turtle	Macroclemys temminckii	Basinwide
Yellow mud turtle	Kinosternon flavescens	Basinwide
Stinkpot	Sternotherus odoratus	Basinwide
Western painted turtle	Chrysemys picta bellii	Basinwide
Map turtle	Graptemys geographica	Basinwide
Mississippi map turtle	Graptemys kohnii	Basinwide
Ouachita map turtle	Graptemys pseudogeographica ouachitensis	Basinwide
Missouri River cooter	Pseudemys concinna metteri	Basinwide
Three-toed box turtle	Terrapene carolina triunguis	Basinwide
Ornate box turtle	Terrapene ornata ornata	Basinwide
Red-eared slider	Trachemys scripta elegans	Basinwide
Midland smooth softshell	Trionyx muticus muticus	Basinwide
Western spiny softshell	Trionyx spinifer hartwegi	Basinwide
Eastern collared lizard	Crotaphytus collaris collaris	Basinwide
Texas horned lizard	Phrynosoma cornutum	Basinwide
Northern fence lizard	Sceloporus undulatus hyacinthinus	Basinwide
Southern coal skink	Eumeces anthracinus pluvialis	Basinwide
Five-lined skink	Eumeces fasciatus	Basinwide
Broadhead skink	Eumeces laticeps	Basinwide
Great Plains skink	Eumeces obsoletus	Basinwide
Ground skink	Scincella lateralis	Basinwide

Prairie-lined racerunner	Cnemidophorus sexlineatus viridus	Basinwide
Western slender glass lizard	Ophisaurus attenuatus attenuatus	Basinwide
Western worm snake	Carphophis amoenus vermis	Basinwide
Eastern yellowbelly racer	Coluber constrictor flaviventris	Basinwide
Prairie ringneck snake	Diadophis punctatus arnyi	Basinwide
Great Plains rat snake	Elaphe guttata emoryi	Basinwide
Black rat snake	Elaphe obsoleta obsoleta	Basinwide
Eastern hognose snake	Heterodon platyrhinos	Basinwide
Prairie kingsnake	Lampropeltis calligaster calligaster	Basinwide
Speckled kingsnake	Lampropeltis getulus holbrooki	Basinwide
Red milk snake	Lampropeltis triangulum syspila	Basinwide
Eastern coachwhip	Masticophis flagellum flagellum	Basinwide
Blotched water snake	Nerodia erythrogaster transversa	Basinwide
Diamondback water snake	Nerodia rhombifer rhombifer	Basinwide
Midland water snake	Nerodia sipedon pleuralis	Basinwide
Rough green snake	Opheodrys aestivus	Basinwide
Bullsnake	Pituophis melanoleucas sayi	Basinwide
Graham's crayfish snake	Regina grahamii	Western counties of the basin
Ground snake	Sonora semiannulata	Basinwide
Midland brown snake	Storeria dekayi wrightorum	Eastern counties of the basin
Texas brown snake	Storeria dekayi texana	Basinwide
Northern redbelly snake	Storeria occipitomaculata occipitomaculata	Basinwide
Flathead snake	Tantilla gracilis	Basinwide
Western ribbon snake	Thamnophis proximus proximus	Basinwide

Eastern garter snake	Thamnophis sirtalis sirtalis	Basinwide
Red-sided garter snake	Thamnophis sirtalis parietalis	Western counties of the basin
Central lined snake	Tropidoclonion lineatum annectens	Newton County
Rough earth snake	Virginia striatula	Basinwide
Western earth snake	Virginia valeriae elegans	Basinwide
Osage copperhead	Agkistrodon contortrix phaeogaster	Northwest counties of the basin
Southern copperhead	Agkistrodon contortrix contortrix	Basinwide
Western cottonmouth	Agkistrodon piscivorus leucostoma	Basinwide
Timber rattlesnake	Crotalus horridus	Basinwide
Western pygmy rattlesnake	Sistrurus miliarius streckeri	Southern counties of the basin

Source: Johnson (1987).

and trout (Weithman, MDC, pers.comm.).

Fishing Regulations

The Elk River basin in Missouri is managed under Missouri's statewide stream regulations with no special management regulations specifically designated for it. The public waters of the Elk River basin in Arkansas and Oklahoma are managed by their respective state fish and wildlife agencies. The lakes in Bella Vista, Arkansas are privately owned and managed. Restrictions and rules can and do change, so it is best to consult the latest fishing regulations.